

ABSTRACT

A high permittivity gate dielectric formed by low temperature metal oxidation is used in an NROM memory cell. The gate dielectric has a dielectric constant greater than silicon dioxide and is comprised of a nanolaminate structure. The NROM memory cell has a substrate with doped source/drain regions. The high-k gate dielectric is formed above the substrate. A polysilicon control gate is formed on top of the gate dielectric. The gate dielectric may have an oxide – high-k dielectric – oxide composite structure or an oxide – oxide – high-k dielectric composite structure.